1872MNRAS..32..150.

altitudes, and therefore being available for the correction of the Moon's parallax.

Cambridge Observatory.

The new Transit Circle has been chiefly employed in determining the places of small stars in the zone lying between 25° and 30° of North Declination, a work which has been undertaken by this Observatory with the view of assisting in carrying out the plan formed by the German Astronomical Society for observing all the stars, to the ninth magnitude inclusive, contained in Argelander's *Durchmusterung des nördlichen Himmels.*

Upwards of 4,500 of these stars have been observed, and their true North Polar Distances accurately calculated.

All the instrumental and clock corrections have been obtained, and are ready to be applied for finding the Right Ascensions, as soon as the reductions to the centre wire, now in progress, are completed. These observations were taken with the instrument clamped in a fixed position, the bisections being made by means of the micrometer, and each star was observed at three of the vertical wires. In this way the stars within a range of about 10′ in declination could be conveniently and rapidly observed. The circle readings were taken at the beginning and end of each set of observations, and were found to remain remarkably constant. The optical power of the instrument is so great, that stars down to the tenth magnitude can be observed, and consequently, in the mode of observation just described, many more stars were taken than were required in order to carry out the plan laid down by the German Astronomical Society. Accordingly, the plan of observation has been lately modified, so as to make it conform more closely to the programme of the Society, and Mr. Simms has made a few alterations in the instrument which have rendered it more suitable for the class of observations required.

The bisection of a star with a single declination wire was found to interfere seriously with the right-ascension observations, so that in the case of very small stars it was found necessary to complete the right-ascension observations before the bisection was made. In order to remedy this, the single wire has been replaced by two parallel wires, 10″ apart; and two similar pairs of wires have been added, each at the distance of about 5′ from the central pair, to give increased facility of bisection in particular cases.

The tangent screw handles have been made more accessible to the observers, one being under the control of the assistant who reads the microscopes, and enabling him to set the instrument with great rapidity within a range of more than half a degree; the other is controlled by the right-ascension observer who makes the bisection.

Mr. Graham has adopted a method of determining the intervals

Downloaded from http://mnras.oxfordjournals.org/ at Oakland University on June 8, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System

1872MNRAS..32..151.

of the right-ascension wires which has been found to be very accurate and convenient. The eyepiece is turned through 90°, and each of the right-ascension wires, now become horizontal, is in turn directed to the horizontal wires of either collimator, and the corresponding readings of both circles are taken.

The values of the revolutions of the micrometer-screws have been found in a similar way with great accuracy.

Small buildings have been erected over the Collimators, which are now therefore virtually in the same room with the Transit Circle, and the consequent steadiness in the images of the collimator wires is very remarkable.

For clock corrections the catalogue of 529 stars issued by the German Astronomical Society has been used. About six of these stars are generally taken in the course of the night's work in addition to the stars near the pole which are observed for instrumental deviation. For instrumental errors, *Polaris* has been observed sixty-six times above the pole and seventy-six times below; and *δ Ursæ Minoris* eleven times above and ten below; 51 *Cephei* seven times above and two below; and *λ Ursæ Minoris* five times above and three below. *Neptune* has been observed eleven times near the opposition.

Observations for finding the errors of level and collimation, and for determining the zenith point, are made daily in observing weather. The error of collimation has been determined 189 times, the error of level 227 times, and the zenith point 236 times. All those errors have been calculated and applied to the observed transits of standard stars throughout the year. The clock corrections and rates are also calculated.

Mr. Simms has rendered the counterpoises much more sensitive by supporting the fulcrums of the levers on knife edges. He has also made some improvements in the driving-clock of the Northumberland Equatoreal, though its performance is still far from satisfactory.

Very little time could be given to extra-meridional observations, but some good observations were obtained of Encke's Comet. The meteorological observations have been made at the usual hours of nine A.M. and three P.M.

Dunsink (Dublin) Observatory.

During the past year Dr. Brünnow has completed the observations on the parallax of five stars, namely, *Groombridge* 1830, *Bradley* 3077, 85 *Pegasi*, 6 *Draconis*, and *α Lyræ*, the two latter having been compared with different stars from those used in the former series. These observations have all been computed and their results are now being printed. Two new series have been commenced on the parallax of the Planetary Nebula, H. IV. 37, and on 61 *Cygni*. The meridional observations have been interrupted for the greater part of the year, as the Transit

Downloaded from http://mnras.oxfordjournals.org/ at Oakland University on June 8, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System